

Item 3. Caprock, Tuffs and Sediments

The CSM that underlies the numerical groundwater and LNAPL models needs to represent albeit in an approximate manner the principle features and processes that affect groundwater flow and contaminant migration. The interim model terminates the saprolites a short distance down-valley of Red Hill; represents the cap rock as a wide-reaching uniform continuous layer; and does not appear to represent older Honolulu volcanics or surrounding finer sediments. These areas were evaporative “lakes” at one time, exhibiting strongly artesian fresh-water conditions, and they may form a barrier to flow influencing groundwater flow and contaminant transport.

As noted elsewhere, gradients simulated by the interim flow model do not comport well with gradients determined from synoptic data in and around Red Hill facility. While this is surely in part related to conditions local to Red Hill, analyses conducted using the interim model also exhibit high sensitivity to conditions downgradient of Red Hill (specifically, in the area broadly represented by the cap rock). This suggests that although uncertain in extent and character, it is important to represent the hydrostratigraphy downgradient of Red Hill as accurately as possible, using as one basis the CSM regarding the distribution and properties of these features (Inset Figure 3.1).

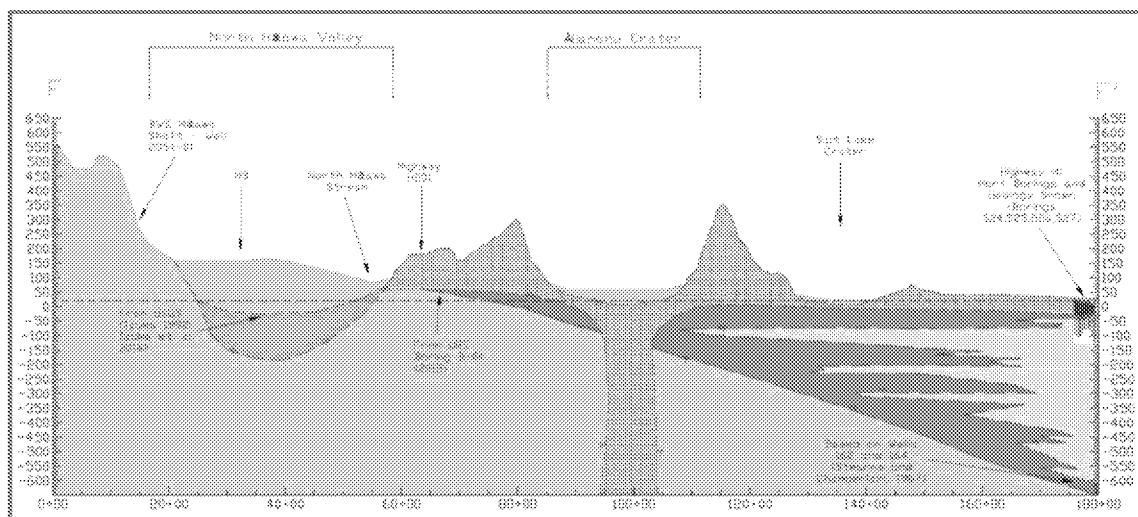


Figure 3.1 Example Figure Illustrating Hydrostratigraphic Features

There are insufficient available data regarding the distribution and properties of downgradient geologic units to accurately and uniquely represent them in the model. However, sensitivity analyses indicate these are important features. Available information must be interpreted in the context of the CSM and AOC to provide an appropriate representation for flow and transport modeling.

The solution to this problem likely lies in two parts: First, re-interpretation of the available data, and expanded use of sensitivity analysis and model calibration to help identify probable geometries and properties, including for example extending the saprolites down-valley, and differentiating Honolulu volcanics from surrounding sediments. Second, based on the anticipated results of sensitivity analyses conducted with this updated representation of these features, consideration should be given to methods of data collection to better constrain the likely presence, extent and properties of these features. For example, other sources of information and data collection – such as airborne gravity surveys – may provide further evidence for the extents of some of these features.